REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the reasons that follow. Claims 41 and 57 have been amended, and Claims 76-78 have been newly added. Claims 1-40, 43, 44, 51, 52, 59, and 60 were previously canceled. Support for the claim amendments and new claim can be found at least in paragraphs [0037] and [0089] of the published application. No new matter has been added. After entry of the claim amendments and new claim, Claims 41, 42, 45-50, 53-58, 61-78 will be pending in the present application.

I. Claim Rejections Under 35 U.S.C. § 103

On page 3 of the Final Office Action, Claims 41, 42, 45, 49, 50, 53, 57, 58, and 61-75 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2006/0209982 to De Gaudenzi et al. (hereinafter "De Gaudenzi") in view of Dabak et al., "Signal Constellations for Non-Gaussian Communication Problems," Statistical Signal and Array Processing, Minneapolis, April 27-30, 1993, Proceedings of the International Conference on Acoustics, Speech and Signal Processing (ICASSP), New York, IEEE, US, 4:33-36 (hereinafter "Dabak"). On page 4 of the Final Office Action, Claims 46-48 and 54-56 were rejected under 35 U.S.C. § 103(a) as being unpatentable over De Gaudenzi in view of Dabak and further in view of U.S. Patent No. 7,269,436 to Won (hereinafter "Won"). Independent Claims 41 and 57 have been amended. Applicants respectfully submit that De Gaudenzi, Dabak, and Won, alone or in combination, fail to disclose, teach, or suggest each and every element of independent Claims 41, 49, and 57.

Amended independent Claim 41 recites, in part, "determining a characteristic of a wireless channel; **selecting** a signal constellation from a plurality of **stored** signal constellations based on the determined characteristic." (Emphasis added). Independent Claims 49 and 57 recite similar elements. Applicants respectfully submit that De Gaudenzi, Dabak, and Won, alone or in combination, fail to disclose, teach, or suggest at least these elements.

De Gaudenzi is directed to a "new class of 16-ary Amplitude and Phase Shift Keying (APSK) coded modulations." (Abstract). As such, De Gaudenzi teaches a new modulation scheme for use with different coding schemes. However, Applicants respectfully submit that De Gaudenzi fails to disclose "selecting a signal constellation from a plurality of stored signal constellations based on the determined characteristic," as recited in Claims 41, 49, and 57.

On page 3 of the Office Action, the Examiner asserted that De Gaudenzi discloses that a "signal constellation is chosen so as to maximize a minimum geometrical distance between the pairs of points of the digital constellation (claim 1)." Claim 1 of De Gaudenzi states:

> 1. A digital modulation method comprising:
> determining a nominal signal to noise ratio for transmission of a digitally modulated signal;
> generating a stream of modulation symbols; and
> mapping said modulation symbols to a digital signal constellation in order to produce a modulated signal, said digital signal constellation comprising a number of digital signal points equally spaced on at least two concentric rings having respective predetermined radii, the digital signal points on each ring having a predetermined relative phase shift with respect to the signal points on the other rings,
> wherein, for a signal constellation with normalized power, at least a ratio of the radii of said concentric rings is chosen so as to maximize a minimum geometrical distance between pairs of points of said digital signal constellation.

(Emphasis added). As such, claim 1 of De Gaudenzi states that modulation symbols are mapped to a signal constellation and that the signal constellation is created such that a minimum geometrical distance between pairs of points of the constellation are maximized. De Gaudenzi fails to disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations based on the determined characteristic," as recited in Claims 41, 49, and 57. "Mapping modulation symbols to a signal constellation" and "creating a signal constellation" are not the same as "selecting a signal constellation from a plurality of stored signal constellations."

On page 2 of the Advisory Action, the Examiner asserted that De Gaudenzi discloses "selecting a signal constellation from a plurality of signal constellations based on the

determined characteristic." To support this assertion, the Examiner stated that (with emphasis added):

> Paragraph 0013 discloses the selection of the inner and outer radii and the angle are selected so as to precompensate distortion effects. The radii are shown in figure 1. The selection of different radii would alter the signal constellation as stated in the previous office action. The inner and outer radii and the angle define the selected (chosen) signal constellation.

Paragraph [0013] of De Gaudenzi states (with emphasis added):

> In a preferred embodiment, the radii of the inner and outer rings and the angle are selected so as to pre-compensate distortion effects of a high power amplifier (HPA). The total number of signal points on the inner and outer rings is preferably 16, but larger constellations can be envisaged. A particular constellation selection consists of 4 signal points on the inner ring and 12 signal points on the outer ring. This constellation, named 4+12-PSK constellation, is considered to be very efficient over non-linear satellite channels using simple pre-compensation.

As such, De Gaudenzi discloses the selection of characteristics of a signal constellation (i.e., radii of the rings and the angle) that are used for the creation of a signal constellation. Selecting characteristics of a signal constellation that will be used to create the signal constellation are not the same as selecting one of a plurality of stored signal constellations. De Gaudenzi fails to disclose, teach, or suggest any stored signal constellations or "selection of a signal constellation from a plurality of stored signal constellations."

Dabak also fails to disclose "selecting a signal constellation from a plurality of stored signal constellations based on the determined characteristic," as recited in Claims 41, 49, and 57. Dabak is directed to a procedure for determining or constructing optimum signal sets. (Abstract). Dabak describes a procedure in which optimum signal constellations are designed using logarithmic error probability rates that are determined based on Kullback information. Designing signal constellations is not the same as selecting one of a plurality of stored signal constellations. Accordingly, Dabak fails to disclose, teach, or suggest "selecting a signal

constellation from a plurality of stored signal constellations based on the determined characteristic," as recited in Claims 41, 49, and 57.

Won also fails to disclose, teach, or suggest a "selecting a signal constellation from a plurality of stored signal constellations based on the determined characteristic," as recited in Claims 41, 49, and 57. On page 5 of the Final Office Action, the Examiner relied on Won merely to disclose that "the transmitter can estimate the channel covariance matrix using a preamble transmitted from the receiver" and "can also update the number of antennas and the power allocation according to the eigenvalues of the estimated covariance matrix."

The Abstract of Won states (with emphasis added):

> A method and apparatus for allocating a power in a multiple-input multiple-output communication system is disclosed. A method of allocating power can include estimating a channel condition based on a reference signal received from a receiver, estimating power gains from the estimated channel condition, and determining respective power levels of transmission signals and a number of available antenna elements for the transmission signals by using the power gains.

Column 7, lines 42-48 of Won states:

> For example, the transmitter can estimate the channel covariance matrix (e.g., the change of the channel for each burst unit (normally, size of 100 symbols)) using a preamble or midamble transmitted from the receiver. The transmitter can also update the number of antennas and the power allocation according to the eigenvalues of the estimated covariance matrix and the size of the eigenvalues.

Accordingly, Won teaches a method for allocating power in a communication system that includes determining a number of available antenna elements. The number of available antenna elements are determined according to the eigenvalues of the estimated covariance matrix. As such, Won teaches only that a number of antenna elements can be determined based on an estimated channel condition. However, Won fails to disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations based on the determined characteristic," as recited in Claims 41, 49, and 57.

For at least the reasons discussed above, De Gaudenzi, Dabak, and Won, alone or in combination, fail to disclose, teach, or suggest each and every element of independent Claims 41, 49, and 57 and their associated dependent claims. A rejection under 35 U.S.C. § 103(a) cannot be properly maintained where the combination of references fail to disclose, teach, or suggest each and every element of the claims. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of Claims 41, 42, 45-49, 50, 53-58, and 61-75 under 35 U.S.C. § 103(a).

II. New Claims 76-78

New Claims 76-78 have been added. Support for Claims 76-78 can be found at least in paragraph [0039] of the published application. Claims 76-78 recite, in part, that "the plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm." As discussed above, De Gaudenzi, Dabak, and Won, alone or in combination, fail to disclose, teach, or suggest "selecting a signal constellation from a plurality of stored signal constellations based on the determined characteristic," as recited in Claims 41, 49, and 57. Applicants respectfully submit that De Gaudenzi, Dabak, and Won also fail to disclose, teach, or suggest that "the plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm," as recited in Claims 76-78. Accordingly, Applicants respectfully request favorable consideration of newly added Claims 76-78.

Applicants believe that the present application is in condition for allowance. Favorable reconsideration of the application is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid

amount to Deposit Account No. 19-0741. If any extension of time is needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extension fees to Deposit Account No. 19-0741.

Respectfully submitted,

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